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Inflation Tax and Deficit Financing in Egypt

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Egypt is able to exact an exceptionally high inflation tax without causing high inflation because of the private sector's large financial holdings. Causes for these large holdings are complex and include money illusion, foreign exchange restrictions, and financial repression. Because of the reliance on the inflation tax — which makes Egypt's overall tax regime fairly regressive — any liberalization of financial markets would put pressure on domestic prices, if the underlying budget deficit cannot adjust fast enough.

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Although Egypt's budget deficit is far above the level found in other low-middle-income countries, the inflation rate in Egypt has never been very high. This is because the country has managed to finance their budget deficits by resorting to an inflation tax that, at 11 percent of GDP in 1987, constitutes a large share of total tax revenues. By contrast, conventional tax revenues come to only 17 percent of GDP.

Dinh and Giugale report a large, underlying inflation-tax base — from which the Egyptian government has collected substantial revenues — that exists because of money balances held willingly or unwillingly by the private sector. Egyptians have opted to hold underperforming domestic currency deposits for a variety of reasons: restrictions on domestic residents' freedom to legally convert Egyptian pounds into U.S. dollars; a limited black market; high insurance costs for the average investor of maintaining assets in other forms, such as gold; and a mild money illusion in the early 1980s.

The authors find that the private business sector, with a net borrowing position of 14 percent of GDP, has benefited from the inflation tax. Households, on the other hand, pay more of the inflation tax than other sectors, turning over 8 percent of GDP to the government this way. This compares with 0.5 percent of GDP that households pay in income tax. Although income tax in Egypt is fairly progressive, the greater reliance on the inflation tax makes Egypt's overall tax structure fairly regressive.

Dinh and Giugale argue that —

- Money illusion cannot last forever — if inflation begins to increase, Egyptian households will ultimately move out of underperforming domestic assets, creating strains on the banking system.

- If foreign exchange and interest rate controls are lifted — as part of an adjustment program, for instance — and if the budget deficit fails to adjust fast enough, the large base for the inflation tax will disappear, leading to a rise in inflation rates to near Latin American levels.

- Understanding the role and size of the inflation tax in Egypt will help in determining the sequencing and equity aspects of any future reform program.

- The financial side cannot continue to bear the burden for the real side; Egypt must move swiftly to cut its budget deficit, the underlying cause of its dependence on the inflation tax.

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CONTENTS

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I. INTRODUCTION

Despit many favorable conditions such as a skilled labor force and abundant na ral resources, in the last decade Egypt has not realized the potential for economic development latent in these conditions. The dominant rol of the public sector in key productive sectors and the system of administered prices in all markets (goods, factor, and foreign exchange markets) has discouraged private incentives and caused inefficient use of resources. At the same time, output growth has resulted from fast-growing, trade-impairing domestic absorption. This situation has been caused by large public sector deficits financed by a combination of foreign and domestic borrowing with inflation taxation in the context of repressed financial markets.

Depending on how the public sector deficits are measured, they could reach 20 percent or more of GDP. Even under the deficit definition used by the IMF's *Government Financial Statistics*[1] for international comparison, the average budget deficit in the mid-1980s amounted to over 11 percent of GDP for Egypt, compared with about 3 percent for Turkey and Peru, 11 percent for Brazil, and 5 percent for Argentina. Part of this deficit was financed by borrowing from abroad, resulting in the debt overhang that Egypt currently faces. Another part was financed by domestic borrowing. Yet another substantial part of the deficit was financed by printing money and by financial repression. This last method of budget deficit financing is the concern of this paper.

At first glance, the money financing of the budget deficit may not appear to be large. Given the size of the deficit, if it had been financed largely through money printing, one would have expected inflation rates comparable to those experienced by Latin American countries. But inflation in Egypt, despite all the difficulties of measuring inflation in a price-controlled economy, has never been very high--at least compared with other countries. One can always argue with official statistics, which do not show the true movement in prices of many goods. Nevertheless, it is undeniable that inflation has never reached the proportion experienced by other countries with much less budget deficit to finance.

In this paper, we argue that a detailed calculation of inflation tax, defined broadly to include the ability to issue high-power money and to generate revenue from financial repression, shows that the public sector has been able to extract significant revenue from this tax. For simplicity, we call this broadly defined concept the "inflation tax in general." Using a new approach to the estimation of the inflation tax in general that is based on institutional accounts of the private sector, we found that this tax, which is levied mainly on households, has been exceptionally large (relative to both the Egyptian economy and in comparison with other countries), due to the large holding of financial assets by the private sector. The causes for this

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1/ For the purpose of cross country comparison, we have used the *Government Financial Statistics* data. Actual data on the country's public finance show much larger budget deficits.

holding are complex; they include some money illusion; control of the foreign exchange market, which reduces the conversion of savings to hard currency (dollarization) but does not preclude it; and financial repression. We found that when these factors cease to exist (for instance, when the foreign exchange and financial markets are liberalized), and if the underlying budget deficit cannot be adjusted fast enough, pressures on domestic prices will build up quickly. Through the proposed approach, we quantified the inflation rates that would result from such a situation. In reviewing the equity aspects of this tax, we found the tax highly regressive, which suggests that the conventional view of the progressive nature of the formal tax system may be mistaken.

Section II describes the main features of the Egyptian economy, focusing on the actual linkages between Egypt's fiscal, monetary, and debt policies, as well as the impact of these policies on inflation. It also traces their evolution in the last decade, leading up to the current situation. Section III proposes a new approach to the estimation of the inflation tax and applies this approach to estimating the revenue from this tax in the case of Egypt. We estimate that this informal source of revenue could exceed 10 percent of GDP, compared with total conventional tax revenue to the central government of about 17 percent of GDP. This magnitude of inflation tax is large compared with other countries. We then review the causes for this tax. In Section IV, we decompose the inflation tax by business and household sectors in order to compare the equity aspects of this tax with other taxes paid by these sectors. Section V presents our summary and policy implications.

II. THE BUDGET DEFICIT AND ECONOMIC POLICIES IN EGYPT

Throughout the 1980s, the Egyptian economy remained heavily dominated by the public sector. By all measures, its deficit has been huge.[2] The definition of this deficit, however, is complicated by the existence of a large public enterprise sector, whose activities are controlled by the government but whose accounts are not known. Furthermore, the budget as administered by the Ministry of Finance excludes the Social Security Fund, which makes international comparison difficult.

The best proxy for a consolidated account of the whole public sector is the so-called "Central Government Account," which includes the budgets of the central government, local governments, and public service authorities; the net profit transfers from public sector companies; and the investment budgets

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2/ In Egypt the public sector includes the central government, local government, and public entities. The latter include: (i) the service authorities whose budgets are integrated into the central government, e.g., agriculture research; (ii) economic authorities such as the Suez Canal Authority; and (iii) public sector companies. Usually only the second and third categories are considered public enterprises. In this paper, however, the relevant concept of "public sector" encompasses every institution whose overall deficit or surplus is financed, directly or indirectly, through money creation.

of all public sector companies. On a cash basis, the deficit on th. account reached 20 percent of GDP during the 1980s[3]. Table 1 shows some features of the Egyptian economy for the fiscal years 1981-88. (The Egyptian fiscal year runs from July 1 to June 30.)

Table 1. EGYPT: SOME MACROECONOMIC INDICATORS
(Average annual growth rates, unless otherwise indicated)
Fiscal Years 1981-88

	FY1981-86	FY1987	FY1988
GDP growth (real terms, p.a.)	6.7	2.5	3.9
Inflation (as % growth in CPI)	16.7	25.2	15.2
Budget Deficit (% of GDP)	22	20	24

Source: Ministry of Planning, Central Bank of Egypt

Until the mid-1980s, the economy grew rapidly, fueled by the large inflow of petroleum revenues, workers' remittances, and tourism. These three sources accounted for over 70 percent of foreign exchange receipts. The increase in external income helped finance the rise in investment and consumption; it also contributed to the growth of government revenues, which rose from 27 percent of GDP to 43 percent during the decade 1974-1984. This growth, in turn, helped finance social programs that improved food intake, clothing and durable goods consumption, education, and health. The result of this rapid growth in domestic demand, however, has been widening deficits in both the current account and the central government budget.

The abundance of foreign exchange created all the classic symptoms of the "Dutch disease": an extraordinary increase in foreign earnings led to a deterioration of the non-oil tradeable sectors in the economy. Commodity exports, excluding oil, fell from US$1.6 billion to US$ 1.1 billion during this decade, as the real effective exchange rate appreciated and the domestic demand outgrew domestic supply. Both agriculture and manufacturing declined as a share of GDP and of total employment, while domestic trade, construction, private sector services, and government administration grew rapidly. The government sector grew fastest, creating low productivity employment for about half of the net increase in the labor force, while few new jobs were created in agriculture and industry. Rigid state controls on both output and factor prices, combined with controls on the foreign exchange market, created distortions in the economy. Egyptian domestic nominal prices moved increasingly out of line with real economic costs and prices. Financial and

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3/ Note that this definition of the Central Government Account encompasses more of the economy than does the definition of the public sector used in *Government Financial Statistics*. In particular, it differs in the treatment of social security and of public enterprise investments and their self-financing investments.

economic profitability pointed in opposite directions in almost all sectors, providing the wrong signals to producers and consumers.

In the mid-1980s, the four main sources of foreign exchange receipts--the three above-mentioned exports plus Suez canal earnings--started to fall. The economy slowed and the financial disequilibria worsened significantly. Despite measures taken by the government, the deficits in the current account and the budget remained unsustainably high--at 9 percent and 23 percent of GDP in fiscal 1986, respectively--while the external debt reached 120 percent of GDP. Inflation accelerated to 25 percent in fiscal 1987 from an average of 17 percent during the preceding 5 years. The authorities responded by tightening import controls, by accumulating arrears in foreign debt payments, and by using more of the foreign currency deposits accumulated in the (public) commercial banks.

Clearly, these trends could not continue for long before a crisis appeared, and in 1987 Egypt entered into a standby agreement with the IMF. The agreement subsequently lapsed. Since then, there have been new, though partial, efforts to undertake a program that combines stabilization with structural adjustment. These efforts are the focus of current negotiations with the IMF and the World Bank (1990-1991) and are not discussed here. For this reason, and partly due to data limitation, this paper deals only with the period from fiscal year 1981 to 1988.

During this period, fiscal, monetary, and exchange rate policies were not pursued with sufficient vigor to attain internal and external balances. On one hand, between fiscal 1982 and fiscal 1987, oil profit and oil-related revenue dropped from 14 percent of GDP (of which 7 percent was tax) to 2 percent as a result of the drop in oil prices. No fiscal policy can be expected to make up for such a precipitous shortfall in so short a period. On the other hand, no extraordinary effort was made to improve the low elasticity of the tax system, as indicated by the low buoyancy (below 1) during the period. Total revenues thus dropped from 42 percent of GDP in fiscal 1981 to some 30 percent over this period. Excluding oil and Suez revenues, total government revenues still fell in real terms by about 2 percent per annum over this period.

Expenditures could not be reduced quickly enough to effect a significant reduction in the huge budget deficit. Expressed in real terms, total government expenditures fell significantly, especially in the two areas of subsidies and the wage bill. Even so, these adjustments were inadequate to prevent the budget deficit from climbing above 20 percent.

Of course, the operational public sector deficit is a more accurate measure of the fiscal burden on the economy than the budget deficit on a cash basis. In principle, if agents do not suffer from money illusion, they will make their portfolio and saving decisions according to the (expected) real interest rate that they receive from the government debt, rather than the nominal rate. On this basis, the computation of the deficit should take into account real interest payments, not nominal ones. This is precisely the essence of the operational definition of deficit. As long as agents are rational, the usual measure of cash deficit over GDP overestimates the real

impact of the public sector's results. In another study (Giugale and Dinh, 1990), we have computed an estimate of the operational deficit of Egypt and found that it is larger still than the simple cash deficit in high-inflation Argentina.

One would expect that, over time, such high budget deficits would lead to higher inflation rates; the non-inflationary means of financing the deficit would quickly disappear. Also, economic agents would adjust their behavior by running down their cash balances, thus generating even less of a base for the inflation tax. However, as mentioned above, inflation in Egypt has remained mild. Between fiscal 1981 and fiscal 1986, the growth in the consumer price index averaged about 17 percent per annum (Table 1).Since then, it has hovered between 10 and 25 percent.

Although fiscal policy itself was not expansionary during this period,[4] the financing of budget deficits of such magnitude requires substantial monetization. In rough numbers, the deficits of over 20 percent of GDP during the period fiscal 1982-87 were financed with external inflow (about 4 to 5 percent of GDP), the social security fund (between 6 to 8 percent of GDP), and by monetization in the form of borrowing from the central bank (for the rest of the deficit, or at least 7 to 10 percent of GDP). Borrowing through issue of domestic bonds was limited, as the treasury bonds held by commercial banks were quickly discounted at the central bank. Monetary policy during this period was accommodating to the government budget; net domestic credit to the central government and public entities more than doubled. Foreign financing of the deficits led to the debt overhang; the external debt doubled from some US$22 billion in fiscal 1981 to about US$43 billion in fiscal 1986.

III. THE BUDGET DEFICIT AND INFLATION TAXATION

In the case of Egypt, foreign resources have only partially financed the public sector deficits. Roughly half of the financing has come from domestic borrowing other than from the central bank, one-fourth from foreign credit, and the rest from money printing. As mentioned above, inflation has remarkably fluctuated around "only" 20 percent. In this section, however, we will argue that there has been an underlying, particularly large inflation-tax base from which the government collected substantial revenues. We further argue that the inflation tax revenue collected by the public sector as a whole (defined below) is enormous by international standards simply because of the large money balances that the private sector (mainly households)has held, either willingly or unwillingly. In effect, the real value of the public sector's domestic debt has been diluted by inflation.

As Keynes (1923) phrased it, the inflation tax is no different from income tax or an excise tax on beer. This erosion of the public debt is equivalent to a tax because, like other taxes, it lowers the private sector's disposable income and increases the government's revenue. In this paper, we

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4/ The expansion in domestic demand has more to do with the exchange rate policy which held the pound overvalued.

define the tax to include two forms. On the one hand, the money held by the private sector does not receive any interest payment, and therefore the erosion of its real value is equal to the inflation rate. On the other hand, other forms of private sector assets such as time and saving deposits receive nominal returns which are often far below the inflation rate. The rate of erosion of the true value of these assets is the difference between the inflation rate and the nominal remuneration. Against this, one should take into consideration the subsidies received by the private sector in the form of deposits by the public sector. These deposits, too, reflect the erosion of true asset value. The general principle is that in an unanticipated inflationary environment, the gainers are the net borrowers and the losers are the net lenders. The net inflation tax is the sum of the inflation tax and the subsidies.

More formally, let IT be the inflation tax, dM be the increase in money needed to compensate for the erosion in real balances and P the price level. Then the above definition yields:

(1) $IT = dM/P$

Multiplying both sides by M/M yields

(2) $IT=(dM/M)*(M/P)$

where dM/M is the rate of growth of money supply.

In the long run, at the steady state with no real growth in output, dM/M can be equated with PI, the inflation rate.

(3) $IT= PI*(M/P)$

Hence, the inflation tax should be thought of as consisting of a tax rate (PI) applied to a base, which is the real money supply (including time and saving deposits to the extent that they have not been paid a remuneration compatible with the inflation rate). When output growth is nonzero, of course, real output will grow; the relation between money supply growth and the inflation rate is then given by:

(4) $dM/M=PI+G$

where G is the growth of real output. The definition of inflation tax in this paper therefore includes under this tax the part attributed to growth of real output, commonly referred to as seigniorage. While the distinction between (3) and (4) is important in understanding the contribution of monetization to inflation, it is not relevant to the discussion of budget deficit financing, for which equation (2) is the relation that matters.

A. An Approach to the Estimation of the Inflation Tax

A straightforward way to estimate the inflation tax is to derive it from the financial accounts of the consolidated public sector.[5] In the case of Egypt, due to the lack of detailed information on that sector, the calculation of this tax is an involving task. The approach we take is exactly opposite to that applied for other countries; namely, we first derive the accounts for the consolidated private sector, consisting of households and private business.[6] To do this, we first integrate the balance sheets of the central bank, the commercial banks, the investment and specialized banks, and the National Investment Bank (NIB), keeping track of the assets and liabilities of these financial institutions and of the following agents vis-a-vis each other: the central government and the public authorities, the public sector enterprises, the household sector, and the private business sector.[7]

We shall see that the last two sectors constitute the main payers of the inflation tax. While it could be argued that the private portion of the commercial banks also belongs to the private sector and therefore is also an inflation taxpayer, its contribution is very small. Recent evidence shows that the private portion constitutes less than 20 percent of the total assets of the commercial banking system. Moreover, the profit margin of this sector is small. For this reason, and also due to the lack of detailed data, this analysis assigns commercial banks entirely to the public sector.

As will be shown shortly, the household sector, through deposits in the banking sector and the NIB is a net creditor to each and every institution in Egypt.[8] A snapshot of the economy at the end of fiscal 1987 would show that

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5/ Daniel Oks first estimated the inflation tax by financial accounts in a World Bank Report (Peru, Report Number 7460-PE, December 15, 1988). The approach taken here differs in the treatment of the tax and in the use of detailed accounts of the private sector to characterize it.

6/ In the section on equity aspects of the inflation tax, it will become clear that this approach allows us to compare the incidence of this tax with that of other taxes paid by the private sector.

7/ The Egyptian financial system consists of the central bank, the NIB, over 40 commercial banks (including 4 public sector banks), 33 investment and business banks (of which 11 are joint ventures and private banks), and 4 specialized banks (including 2 real estate banks, the industrial bank, and the bank for agricultural credit with its 17 affiliates in the governorates). In addition, there are at least 7 insurance institutions and over 300 Islamic development companies. The NIB is essentially a government-owned institution that extends long-term investment loans to public enterprises.

8/ See previous footnote. Sources of funds for the NIB come from the "captive" sources of the Social Insurance Fund, the Pension Fund, and the Post Office Savings.

households and foreign sectors basically financed the whole economy. The largest net borrower is the central government (53 percent of GDP), closely followed by commercial banks including the four largest public sector banks. The public enterprise sector owed debt worth about 41 percent of GDP; the central bank owed about 19 percent, while private business owed only 14 percent.

Although the inflation tax could be calculated in an easier way, the approach used here is more illuminating because it shows the many relations among various agents and allows a more accurate analysis of the flow and stock variables. While the calculation is inherently more cumbersome, it does provide insights into the equity aspects of the tax.

In the formulation adopted here and in the Appendix, A(i,j) represents a category of financial assets owed by sector i arising from transactions in sector j. Similarly, B(i,j) is a category of financial liability of sector j to sector i. A and B can take the following values:

Asset and Liability Categories	
B	Bonds
C	Cash in vault
DD	Deposits in domestic currency
DD_CLEAR	Checks held in clearance
FCDD	Foreign currency demand deposits
FCL	Loans in foreign currency
FCTD	Time deposits in foreign currency
L	Loans in domestic currency
NW	Net worth
R	Reserves
TD	Time deposits in domestic currency

The sectors i and j can take the following values:

Financial Sectors

CBE	Central bank
BC	Commercial banks
NIB	National Investment Bank
IDB	Other financial institutions, including the investment and specialized banks

Nonfinancial Sectors

CG-PA	Central government and public authorities
HH	Households
PB	Private business
PSE	Public sector enterprises

For example, DD(PB,BC) represents demand deposits that are an asset of private business from transactions in commercial banks. It also represents the corresponding liability of the commercial banking sector to the private business sector.

The Appendix illustrates the consolidation of balance sheets for each of the financial sectors. Tables 2 and 3 use such balance sheets to derive the financial position of the private business and household sectors. (The Appendix gives balance sheets for a single fiscal year; the tables summarize similar balance sheets for each of four fiscal years.)

B. Inflation Tax in Egypt: Estimation Results

Table 2 shows the financial position of the private business sector, derived from balance sheets like those shown in the Appendix. All variables are expressed as percentages of GDP. Private businesses' assets appear to have been stable, at about a quarter of GDP, throughout the second half of the 1980s. Their deposits in the financial system are rather small, consisting of an equal amount of demand deposits in domestic and in foreign currency used for business transactions. The largest asset category is lending to the NIB, mostly from insurance companies and the Pension Fund. On the liability side, by far the largest category is loans from commercial banks (17-18 percent of GDP), mostly in domestic currency, but an important part is also held in foreign currency (about 7-8 percent of GDP). Loans from the investment banks and specialized banks also constitute an important resource.

The net borrowing position of the private business sector, about 14 percent of GDP, means that the sector has been a beneficiary of the inflation tax. Moreover, this sector also holds a net liability in foreign currency. A devaluation could certainly cause private business some problems, although the problem is not as severe as it is for other sectors, notably the central bank.

Table 3 shows the financial position of the households sector, which turns out to be the main payer of the inflation tax. At the tax's peak in fiscal 1987, households paid out some 8 percent of GDP, or about 80 percent of the inflation tax paid by the entire economy. The largest category of household assets was time deposits in both domestic and foreign currency. The latter (not used in the calculation of inflation tax) has grown rapidly in recent years, surpassing the former in terms of deposits by fiscal 1989. Another equally important category is households' lending to NIB, which amounted to more than the time deposits in the system. Table 3 makes clear the extent to which credit has been granted to the household sector: less than 2 percent of GDP. It also shows that consumer lending has not been significant; consequently, the use of interest rates as an instrument for curbing final consumption may be limited. Foreign currency lending has been significant, amounting to about 19 percent of GDP in fiscal 1987 and 23 percent in fiscal 1988.

On the basis of these accounts, the inflation tax for the whole economy can be calculated. The computation excludes foreign currency accounts. Table 4 shows components of the inflation tax as percentages of GDP. The first row indicates the nominal (i.e., before adjustment for inflation), gross (i.e., before the inflation subsidies) amount of the tax calculated from the consolidated accounts. The second row shows this amount expressed in real terms and represents the gross inflation tax. The third row shows the nominal subsidies calculated from the liability side of the consolidated accounts.

Table 2. NET FINANCIAL POSITION OF PRIVATE BUSINESS
(Percentage of GDP at Current Market Prices)

	FY85	FY86	FY87	FY88
ASSETS	31.9%	33.2%	32.5%	30.1%
C(PB,CBE)	8.2%	8.0%	7.4%	6.0%
DD(PB,BC)	2.1%	2.1%	2.1%	1.7%
DD_CLEAR(PB,BC)	-0.2%	-0.1%	-0.1%	-0.2%
FCDD(PB,BC)	1.9%	2.3%	2.2%	1.8%
DD(PB,IDB)	0.8%	0.8%	0.7%	0.8%
FCDD(PB,IDB)	0.6%	0.6%	0.5%	0.4%
L(PB,NIB)	18.5%	19.5%	19.8%	19.6%
LIABILITIES	35.5%	39.7%	39.7%	35.3%
L(BC,PB)	16.5%	18.2%	17.4%	15.9%
FCL(BC,PB)	6.8%	7.6%	7.6%	6.2%
L(IDB,PB)	7.3%	8.6%	9.4%	8.9%
FCL(IDB,PB)	5.0%	5.4%	5.2%	4.2%
NET ASSETS	23.9%	25.4%	25.3%	24.2%
NET LIABILITIES	35.5%	39.7%	39.7%	35.3%
NET LENDING	-11.6%	-14.4%	-14.4%	-11.0%
OF WHICH FC	-9.3%	-10.0%	-10.2%	-8.2%
OF WHICH DC	-2.3%	-4.3%	-4.2%	-2.8%

Source: Derived from Appendix data.

The next row is the amount in the third row expressed in real terms. Finally, the net inflation tax shown in row 5 is calculated as the difference between row 2 and row 4.

As Table 4 shows, the magnitude of the inflation tax in Egypt is astounding: It reached a peak in fiscal 1987 at 10.6 percent of GDP. To provide a basis for comparison, total conventional tax revenue that year in the central government budget is roughly 17 percent of GDP. It is clear that, through administering a number of prices, including domestic interest rates and exchange rates, the government has been able to extract enough marginal revenue from the inflation tax to avoid the need to accelerate money printing, and through it, higher inflation rates.

Table 3. NET FINANCIAL POSITION OF HOUSEHOLDS
(Percentage of GDP at Current Market Prices)

	FY85	FY86	FY87	FY88
ASSETS	72.4%	75.3%	75.8%	77.1%
C(HH,CBE)	15.6%	15.0%	13.1%	12.4%
DD(HH,BC)	4.1%	3.9%	3.8%	3.5%
DD_CLEAR(HH,BC)	-0.4%	-0.3%	-0.3%	-0.3%
FCDD(HH,BC)	1.6%	1.7%	1.8%	1.8%
TD(HH,BC)	19.7%	19.8%	19.5%	18.7%
FCTD(HH,BC)	9.3%	11.5%	14.0%	17.2%
DD(HH,IDB)	0.1%	0.1%	0.1%	0.1%
FCDD(HH,IDB)	0.3%	0.3%	0.3%	0.3%
TD(HH,IDB)	0.7%	0.6%	0.6%	0.4%
FCTD(HH,IDB)	2.7%	2.9%	3.2%	3.5%
L(HH,NIB)	18.5%	19.5%	19.8%	19.6%
LIABILITIES	1.8%	1.6%	1.5%	1.4%
L(BC,HH)	1.5%	1.3%	1.1%	1.0%
FCL(BC,HH)	0.1%	0.1%	0.1%	0.1%
L(IDB,HH)	0.1%	0.1%	0.1%	0.1%
FCL(IDB,HH)	0.1%	0.1%	0.1%	0.2%
NET ASSETS	57.1%	60.5%	63.0%	65.0%
NET LIABILITIES	1.8%	1.6%	1.5%	1.4%
NET LENDING	55.3%	58.9%	61.5%	63.7%
OF WHICH FC	13.7%	16.3%	19.1%	22.5%
OF WHICH DC	41.6%	42.6%	42.4%	41.1%

Source: Derived from Appendix data.

Table 4. TOTAL INFLATION TAX
(Percentage of GDP)

		FY85	FY86	FY87	FY88
1.	NOM. TAX, GROSS	5.9%	8.1%	16.7%	8.3%
2.	REAL TAX, GROSS	5.2%	7.0%	13.3%	7.2%
3.	NOM. SUBSIDY	0.5%	1.1%	3.4%	0.6%
4.	REAL SUBSIDY	0.4%	0.9%	2.7%	0.5%
5.	NET NOM. TAX	5.4%	7.0%	13.3%	7.7%
6.	NET REAL TAX	4.8%	6.1%	10.6%	6.7%

Source: World Bank data

In that context, each percentage point of inflation dilutes the real value of the money base and of domestic-currency deposits, rendering sizable revenues. In a rational, frictionless situation that could hardly happen; savers do not put their money in deposits (except for transactions use) if they know beforehand that the real value of principal-plus-interests upon withdrawal will be lower than the real value of their initial investment. Simple stocking of durable goods such as real estate is more profitable and equally risky (i.e., riskless). The very contraction in the supply of deposit money would eventually drive nominal interest rates up to positive, expected real levels.

C. Inflation Tax: An International Perspective

How does the Egyptian inflation tax compare to that of other countries? Table 5 compares that tax in Egypt and Peru, in both gross and net terms. It is clear that the size of the inflation tax in Egypt far exceeds that of Peru, even though the latter has an inflation rate exceeding 100 percent.

In fact, the cross country comparison of inflation taxes shown in Table 6 indicates that Egypt far exceeded other countries in magnitude of this tax. A word of caution must be added here because the calculation used in Table 6, while uniform across all countries, is not the same used elsewhere in this report. Table 5, which shows the inflation tax derived for Egypt and Peru on a more comparable basis, is better suited to the purposes of this analysis.

But how has Egypt been able to extract so much inflation tax revenue from such a low tax rate? The answer is the large base on which the tax is levied. A comparison of the tax base across countries will be presented below, but first it is important to emphasize that Egypt's fortunate large-base-cum-low-rate scenario has been sustainable only because *ex ante*, or expected, real interest rates were negative. That is, for some reasons, there have been investors willing (or obliged) to let their real wealth dilute. Otherwise, they would have demanded nominal rates of return large enough to compensate for their inflation expectations over the bonds' maturity. This would have caused higher nominal deficits and, ceteris paribus, higher monetization and inflation.[9]

From the *ex post*, or actual, real interest rate series, we cannot unequivocally infer the behavior of the expected interest rates; expectations are not directly observable. Optimally, more sophisticated proxies for expected inflation could be used (ARIMA fittings, instrumental variables estimation of broadly defined equations, inverted money demand models, etc.).

9/ Of course, it could be argued that the government may have unexpectedly accelerated inflation after floating its debt, and so may have raised inflation tax revenues from investors who were already locked in. However, this explanation is not very convincing. It implies that for at least a decade, the authorities were able to deceive private agents without serious loss of credibility and, hence, without the need to resort to higher and higher inflation surprises.

Table 5. ESTIMATES OF INFLATION TAXES FOR EGYPT AND PERU 1985, 1986, 1987
As percentage of GDP

	Egypt	Peru	Egypt	Peru	Egypt	Peru
	1985		1986		1987	
Inflation Tax	5.2	2.5	7.0	3.2	13.3	4.2
Inflation Subsidy	.4	2.8	.9	1.6	2.7	2.8
Net Inflation Tax	4.8	-.3	6.1	1.6	10.6	1.4

Sources: Peru, World Bank Report Number 7460-PE
Egypt, Central Bank of Egypt calculation

Table 6. INFLATION TAX IN SELECTED COUNTRIES, 1987

Country	Inflation tax (percentage of GNP)
Egypt[a]	11.7
Argentina	4.0
Cote d'Ivoire	0.5
Ecuador	2.0
Ghana	2.0
Mexico	3.7
Nigeria	0.9
Peru[a]	4.8
Philippines	0.6
Turkey	2.8
Zaire	4.2

Source: World Development Report, 1989, Box 4.5.

a/ Figures differ from those in Tables 4 and 5 because GNP, rather than GDP, is used here.

However, the sheer magnitude and persistence of the negativity of those real rates make it difficult to believe that it is entirely due to forecast errors. (Even rough survey evidence shows that Egyptian agents know beforehand that government debt papers pay negative real returns).

The fact that such sizable revenues could be realized with such a moderate inflation rate depends crucially on the *base* on which it is levied. For a broad comparison across countries with financial repression, M2 can be used as an indicator of this base.(Strictly speaking, the base should be M2 minus the foreign currency deposits, as these do not generate any inflation tax.) Table 7 shows the base of the inflation tax for Egypt and other countries at about the same stage of development. It is clear that Egypt has the highest ratio of money to GDP.

D. Inflation Rates for Alternative Hypothetical Money Holdings

In the case of Egypt, the calculations summarized in Table 8 show that if the financial sector were of the average size for a lower-middle income country (i.e., if instead of 94 percent, the money holding by the private sector is reduced by one-half or one-fifth), the inflation rate would have to be substantially higher than the actual level, to generate the same amount of inflation tax. Suppose, for example, people had held only one-fifth of the cash plus demand and time deposits that they actually held in these years To maintain the same magnitude of inflation tax revenues, the inflation rate would have had to accelerate to over 100 percent.

E. Causes for the Large Money Balances

The large size of the inflation tax base, in turn, may be attributed to several factors. First, money illusion may have played an important role. Second, foreign exchange control effectively precludes the private sector from holding more of other types of assets, such as foreign currency deposits. Third, interest has been exempt from income tax since 1981. Law 157 of 1981 specified that all interest on deposits with banks and post offices is exempt from the tax on movable capital.

Why does a saver put part of his/her wealth in an asset that he/she can rationally expect will lose value? Why do Egyptian depositors accept negative expected real interest rates? A simple explanation would be that those agents are not rational; they suffer from some degree of money-illusion and do not fully understand the real implications of inflation. Although we cannot discard this argument outright, it has some weaknesses. First, the depositors are not homogeneous in terms of information; both individual savers (who presumably are uninformed) and professional corporate managers participate in the Egyptian deposit market. Second, the negativity of real interest rates on deposits has been operative for at least a decade; by now, the real loss of wealth should have supplied savers with a reasonable

Table 7. MONEY AND INFLATION
AN INTERNATIONAL PERSPECTIVE

Countries	Average Money Outstanding (% of GDP) 1965	1980	1987	Average GDP Deflator 1980-87
Egypt	35.3	52.2	93.8	9.2
Peru	18.7	16.3	9.2	101.5
Mexico	25.1	27.5	21.0	68.9
Turkey	23.0	16.7	26.5	37.4
Argentina	...	22.2	19.1	298.7

Source: World Development Report, 1989 p. 189.

Table 8. EGYPT: INFLATION TAX
FOR ALTERNATIVE MONEY HOLDING[a] PATTERNS

	FY85	FY86	FY87	FY88
ACTUAL MONEY HOLDING				
Inflation Rate (%)	14.3	16.1	25.2	15.2
Inflation Tax (% GDP)	4.8	6.1	10.6	6.7
ONE-HALF MONEY HOLDING				
Inflation Rate	57.1	64.5	100.6	60.8
Inflation Tax	3.3	4.0	5.7	4.7
ONE-FIFTH MONEY HOLDING				
Inflation Rate	85.7	96.8	150.9	91.2
Inflation Tax	4.3	5.1	6.9	6.0

Source: World Bank data for actuals; simulations based on equation 2 for alternative scenarios.
[a] Money holding is simply defined here as currency plus demand and time deposits in domestic currency.

understanding of the consequences of inflation. If irrationality is the explanation behind Egypt's huge inflation-tax base, the system's stability cannot be taken for granted. Sooner or latter, persistent and increasing inflation will drive people away from domestic-currency deposits, leaving the burden of the underperforming public sector debt on the banking system alone, which may be unable to cope with that burden.

It is also possible that economic agents must accept negative expected real interest rates simply because alternatives are lacking. Evidence for this line of argument comes from the period 1987-88, when the Islamic investment companies were allowed to collect savings at (effectively) a free market rate. It is estimated that some LE 4 billion were deposited in those companies, which pay out yields in the range of 2 to 5 percent per month. Some of these companies subsequently went bankrupt, leaving depositors with large losses.

Foreign currency deposits (mostly in U.S. dollars) may appear to be an alternative to domestic assets. In fact, these deposits have grown at a much faster rate than the LE deposits and have continued to grow to date. By the end of calendar 1989, about 45 percent of money and quasi-money was held in foreign currency. This raises important questions on the ability to continue financing the budget deficit with the inflation tax. Increased holding of foreign currency means a decline in holdings of domestic currency. This is equivalent to moving toward a lower inflation tax base in Table 8. In fact, one plausible explanation for the low monetary base of Latin American countries may be the substitution of foreign assets for holdings in domestic currency.

The expected remuneration of foreign currency deposits far exceeded that on domestic currency. These deposits, typically denominated in U.S. dollars, were expected to earn LIBOR rate coupled with gains from exchange rate devaluation. During the 1980s, the mean nominal return on time deposits in local currency has been estimated at 10.6 percent, while the corresponding return on foreign currency was 26 percent (Dailami and Dinh, forth.).

The question, therefore, is not whether people switched to foreign currency but why they did not switch faster. The answer is that domestic residents cannot freely convert deposits in Egyptian pounds into U.S. dollar deposits. Instead, only traceable bank accounts from abroad can be held as foreign currency deposits. This effectively prevents a faster dollarization of the economy. As explained earlier, the current foreign exchange regime is an asymmetric, non-market, administered-exchange-rate system. All legal transactions must be made at one of the official rates.
Effectively, then, holders of domestic currency cannot legally convert it into foreign currency. There is a foreign exchange black market, but it is heavily policed, and penalties for dealing in it are severe.

This leaves the stocking of real goods as the only viable alternative to domestic-currency deposits. The problem is that, in general, those goods are not liquid or are costly to store safely. Notably, there exist very active markets for jewelry in Egypt, especially gold, but secure storage costs may be proportionally too big for a small investor.

The above argument, however, cannot explain the entire stock of money balances. It implies that Egypt's large inflation-tax base is due to the effective suppression of its black foreign exchange market. This traps domestic savers into real-loss-making deposits, indirectly helping to finance large public sector deficits. However, tough policing of that black market only started after 1987 when an official commercial bank rate was established. Prior to that year, there had been less restriction on the parallel foreign exchange market. In other words, the conversion into foreign currency was an available option during most of the 1980s, and yet, negative expected real interest rates were operative. Also, in spite of foreign exchange controls, the economic incentives for dealing in the black market are huge. Assuming that the exchange rate there follows an exact purchasing parity power, and that there is no inflation abroad, the maximum value of the percentage bid-ask spread acceptable to customers would be equal to the absolute value of the real interest rate on deposits, which is around 10 percent. This should be appealing enough for clandestine dealers to continue doing business.

Overall, the most plausible explanation for the enormous base of the inflation tax, i.e., the holding of underperforming domestic-currency deposits by Egyptian savers appears to be mild money illusion during the beginning of the 1980s. When this waned, repression of the foreign exchange market closed other avenues. If this explanation is valid, then the system is unsustainable. Inflation may not yet have surpassed the critical threshold, beyond which real-value losses and/or arbitrage profits become too big to be ignored. When that threshold is reached, savers will no longer accept the current level of nominal expected interest rates. If they withdraw their implicit support for the banking system, it, in turn, will not be able to afford its holding of public debt. The budget will not feel the full impact of this change, because a large part of the debt is still held by captive sources of fund such as the Pension Fund. Still, in the end, the government will have to accelerate inflation in order to raise the same inflation-tax revenue on a shrinking base.

IV. EQUITY ASPECTS OF THE INFLATION TAX

It is well known that unanticipated inflation benefits debtors at the expense of creditors and that, ceteris paribus, those with fixed incomes such as civil servants and pensioners usually suffer the most. The aggregate inflation tax discussed above, while important to the financing of the budget deficit, raises more concerns on the equity aspects of the tax than on grounds of efficiency. After all, from the country's perspective, the losses of one group are offset by the gains of others. From a policy viewpoint, it is even more important to ask about the tax incidence issue: who pays for this tax and is it levied according to the ability to pay? This section attempts to answer these questions.

In Egypt, the conventional tax system does not embody horizontal equity, for it is still based on a schedular system with different tax rates for different sources of income. Most income tax comes from the salaried workers. There is still a high rate of tax evasion among professionals and those

working in the informal sector. With respect to vertical equity, or the ability to pay, the existing income tax does indeed have a progressive component--if the tax is collected.

Individual income tax revenues, however, amounted to less than 2 percent of total revenue in fiscal 1987, compared with 10 percent in Morocco and 6 percent in Tunisia. In fact, the income tax averaged 1.5 percent of GDP over fiscal 1981-87, which is very low compared with other middle income countries. Table 9 compares Egypt with countries having similar characteristics. This comparison shows that while government revenues are high in Egypt, the share of indirect taxes is also exceptionally high. To the extent that the sales taxes and customs tariffs, the most important sources of indirect taxes, are regressive compared with income taxes, the tax system is fairly regressive. To the extent that the share of indirect taxes has increased during the 1980s, this feature has worsened.

An analysis of tax incidence is beyond the scope of this paper, especially given the scarcity of data. Previous studies (e.g., Eckaus et al., 1976) concluded that the system is mildly progressive. The existing distribution of income in Egypt compares rather well with other developing countries. The ratio of incomes of the richest 20 percent of the population to the poorest 20 percent is about 6 to 1, and Egypt ranks in the top third among the 46 countries where such measures were available.[10] Information on the distribution of assets and wealth is not available. The task of assessing the incidence of the inflation tax is made difficult by the lack of data on interest income Data are lacking because of the exemption of interest on deposits with banks and the post office, as well as all interest earned on nonresident holdings (domestic and foreign currency), as stipulated by Law 157 of 1981.

A. Inflation Tax and the Corporate Income Tax.

To compare the inflation tax with other income taxes in Egypt, we decompose the economy-wide inflation tax into business and household categories. Table 10 shows the components of the tax paid by the business sector. The inflation tax paid by this sector amounted to between 1 and 2 percent of GDP, which suggests that the sector is well aware of the adverse effects of the tax and has been successful in avoiding it. The gross tax amounted to about 3-4 percent of GDP, which is significant, but the sector also received subsidies amounting to about 2 percent of GDP.

10/ World Development Report 1989, p. 222.

Table 9. GOVERNMENT REVENUES
An International Perspective
(1987)

	Egypt	Morocco	Tunisia	Peru	Argentina	US
Total Revenue (as % of GDP)	31.0	25.6	31.0	11.9	21.6	20.1
Percentage of Total Revenues	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:						
Individual Income Tax	1.4	10.4	5.5	2.7	.2	43.1
Corporate Income Tax	10.5	7.7	6.2	12.7	.1	9.3
Property Taxes	1.0	2.5	1.9	5.9	6.7	.8
Social Security	13.5	5.2	7.9	---	25.2	32.8
Domestic Taxes of Goods and Services	11.1	46.0	19.8	41.8	37.4	3.5
Taxes on International Trade	12.4	14.2	28.4	29.2	12.0	1.7
Other Taxes	6.3	4.7	1.5	1.6	3.0	---
Other Non Tax and Income	43.8[a]	9.3	28.8[a]	6.1	15.4	8.8

Source: World Development Report, 1989, and Government Financial Statistics Year Book, 1988, p. 39.
[a] Includes petroleum income.

Although corporate income tax currently accounts for a larger share of revenue than individual tax, over 40 percent of the former is paid by revenues from oil and the Suez Canal. Effectively, the corporate sector pays very little. Although the official rate ranges from 32 to 40 percent, depending upon the sector, most businesses benefit from a wide range of exemptions and deductions, amounting to a rather liberal tax holiday extended by the corporate tax laws, such as Laws 1, 43 (now 230), 86, 157, 159, and the generous provisions related to investments.

Given that most of the formal corporate business sector is publicly owned, and most private businesses prefer to keep their operation small in order to avoid taxation, it is likely that most of the corporate income tax is paid by public enterprises, while the private sector pays very little of this tax. By forcing everyone to pay indirectly through the public enterprises, the business component of the inflation tax may have a progressive aspect. It should be noted that the size of that inflation tax is almost as large as the actual corporate tax paid by the business sector, excluding oil and Suez canal revenue.

Table 10. EGYPT, INFLATION TAX PAID BY THE BUSINESS SECTOR

	FY95	FY86	FY87	FY88
ASSETS				
C(PB,CBE)	0.8%	1.0%	1.5%	0.9%
DD(PB,BC)	0.2%	0.3%	0.4%	0.3%
DD_CLEAR(PB,BC)	-0.0%	-0.0%	-0.0%	-0.0%
DD(PB,IDB)	0.1%	0.1%	0.1%	0.1%
L(PB,NIB)	0.9%	1.3%	2.9%	1.4%
LIABILITIES				
L(BC,PB)	0.1%	0.4%	1.4%	0.0%
L(IDB,PB)	0.3%	0.5%	1.2%	0.5%
GROSS INFLATION TAX	2.0%	2.6%	4.9%	2.7%
GROSS SUBSIDIES	0.4%	0.9%	2.6%	0.5%
NET INFLATION TAX	1.6%	1.7%	2.3%	2.2%

Source: Derived from Appendix data.

B. Inflation Tax and the Individual Income Tax.

Table 11 presents the inflation tax paid by the household sector. At its peak in fiscal 1987, this tax represented over 8 percent of GDP, compared with the 0.5 percent of GDP actually paid in as the formal income tax. Households pay inflation tax mostly on currency holding, time deposits, and assets held by the NIB. It is important to note that this sector has very little debt owed to the other sectors, so that its gross and net inflation taxes are very close. The large magnitude of the tax indicates that the tax system is much more regressive than the usual analysis indicates. The inflation tax could be thought of as a flat rate income tax with no deductions and no exemptions. To the extent that the inflation tax is withheld at source and there is no evasion or cheating, it does embody a positive element of fairness. However, in terms of equity, because it is a flat rate tax, it is much more regressive than other forms of income taxes that have progressive rates built in.

Table 11. EGYPT, INFLATION TAX PAID BY HOUSEHOLDS

	FY85	FY86	FY87	FY88
ASSETS				
C(HH,CBE)	1.5%	1.8%	2.6%	1.9%
DD(HH,BC)	0.4%	0.5%	0.8%	0.5%
DD_CLEAR(HH,BC)	-0.0%	-0.0%	-0.1%	-0.0%
TD(HH,BC)	0.6%	1.0%	2.4%	1.1%
DD(HH,IDB)	0.0%	0.0%	0.0%	0.0%
TD(HH,IDB)	0.0%	0.0%	0.1%	0.0%
L(HH,NIB)	0.7%	1.0%	2.6%	1.0%
LIABILITIES				
L(BC,HH)	0.0%	0.0%	0.1%	0.0%
L(IDB,HH)	0.0%	0.0%	0.0%	0.0%
GROSS INFLATION TAX	3.2%	4.3%	8.4%	4.5%
GROSS SUBSIDIES	0.0%	0.0%	0.1%	0.0%
NET INFLATION TAX	3.2%	4.3%	8.3%	4.5%

Source: Derived from Appendix data.

As mentioned above, the existing system of formal income tax on individuals in Egypt appears to be mildly progressive. In addition to the general tax on global income, there are four scheduled individual income taxes. The general tax, which represents less than 1 percent of total revenue, is fairly progressive because of the high exemption level (LE 2000 per year), and a highly progressive tax rate schedule, which ranges between 8 and 65 percent. Of the four schedular taxes, the largest is the tax on commercial and industrial profit, which has the same rate structure as the tax on corporations and varies between 32 and 40 percent. This tax, as well as the tax on capital income and on noncommercial professions, is expected to be progressive. The tax that appears to have some regressive properties is the tax on salaries, which varies between 2 and 22 percent.

All in all, the inflation tax is more regressive than other income taxes. Moreover, many of the rich are more able to keep assets in foreign currency, as are workers from abroad. To that extent, it is most likely that the middle and low income groups are paying a high proportion of this tax.

C. Inflation Tax and the Social Security Tax.

In addition to the regressive nature of the inflation tax on currency and deposits held in the banking system by households and by the business sector, the net lending that these two sectors extend to the NIB, through their contribution to the Social Security system, also constitutes a

regressive element. As shown in Tables 10 and 11, the inflation tax from this source contributed more than 50 percent of the total inflation tax in the economy. The Social Security system consists of a general scheme covering government employees and the formal private sector, as well as three other schemes covering the self-employed, farmers, the working poor, and Egyptian workers abroad. Contributions to the general scheme from the private sector are 40 percent of monthly salary up to LE 250 and 35 percent for salaries above LE 250. Hence, it is a regressive scheme, in addition to the issue of intergenerational transfer. Furthermore, the sustainability of such a system is increasingly called into question, particularly in view of the low real rate of return from the public investments to which these funds are allocated.

V. POLICY IMPLICATIONS.

The magnitude of the inflation tax and its negative impact on equity raise several concerns. First, the base of this tax has been maintained through a combination of some money illusion with controls on foreign exchange and interest rates. Barring continuing money illusion, when these controls disappear, as they should if Egypt were to achieve sustainable growth by implementing a strong program of stabilization with adjustment, the forces that have kept this tax base large will disappear. The tax base will quickly shrink, at least during the initial period. If the budget deficit cannot be adjusted fast enough (and usually years are required for fiscal measures to take effect, while financial decontrol could yield results overnight), pressures on domestic prices will build up quickly. For instance, if for some reason--perhaps lack of confidence or lack of external financing commitments--the dollarization accelerates, the change will be facilitated by the liberalization of the foreign exchange market. Meanwhile, if the budget deficit cannot be adjusted fast enough to reduce the need for the inflation tax, the inflation rate will accelerate in the manner indicated by Table 8.

Alternatively, if the liberalization of the financial market reduces the base of the inflation tax (perhaps overnight), while the budget deficit is still maintained at the present level, inflation could accelerate to the level prevailing in some Latin American countries. This could occur independently of adjustments in relative prices, which would also be needed if structural adjustments were to take place. Therefore, the coordination of financial policies, whose implementation is normally fast, with policies in the real sphere is crucial.

Second, the approach used here to calculate the inflation tax can facilitate this crucial coordination by enabling one to determine who is paying how much of the inflation tax. Such knowledge is important not only for the sequencing of reform but also for its equity aspects, which have proved to be just as valuable. Of course, in the longer run, such policy cannot substitute for a complete liberalization of all markets to attain maximum efficiency.

Third, the ultimate issue on the real side must be addressed; the budget deficit must be cut one way or another.So long as it remains huge, and cannot be financed by other means, the inflation tax is still necessary.The financial

side cannot be left to bear the adjustment burden of the real side for long. The bottom line is that the root cause of the inflation tax--namely, the budget deficit--has to be resolved quickly.

REFERENCES

Dailami, M. and H. Dinh, " Interest Rate Policy in Egypt: Its Role in Stabilization and Adjustment," Forthcoming PRE Working Paper, World Bank, Washington, D.C. , April 1990.

Dornbusch, R., " Experience with Extreme Monetary Instability," processed paper, World Bank, Washington, D.C. , March 1990.

Dornbusch, R. and H. Wolf, " Monetary Overhang and Reforms in the 1940's," processed paper, World Bank, Washington, D.C. , September 1990.

Giugale, M. and H. Dinh, "Money, Inflation and Deficit in Egypt," December 1990, PRE Working Paper 553.

Keynes, J.M., *A Tract on Monetary Reform*, 1923. Reprinted by the Royal Economic Society in 1971.

APPENDIX

DETAILS ON THE CONSOLIDATION OF INSTITUTIONS.

To illustrate the method used to estimate inflation tax on nonfinancial sectors, this appendix shows the balance sheets for various institutions in fiscal 1985, as percentages of GDP. The source of the data is the Central Bank of Egypt. Lines from these balance sheets are then summed up in Tables 2 and 3 in the text, to derive the net financial position of the business sector and of households, respectively.

The same formalism is used here as in the text. Let A(i,j) be the financial asset owed by sector i arising from transaction in sector j, and B(i,j) be the financial liability of sector j to sector i. The following categories of assets and liabilities are used:

R	Reserves
L	Loans in domestic currency
FCL	Loans in foreign currency
C	Cash in vault
DD	Deposits in domestic currency
DD_CLEAR	Checks held in clearance
FCDD	Foreign currency demand deposits
TD	Time deposits in domestic currency
FCTD	Time deposits in foreign currency
B	Bonds
NW	Net worth

The sectors include:

CBE	Central Bank
BC	Commercial Banks
IDB	Other Financial Institutions, including the investment and specialized banks.
NIB	National Investment Bank
PB	Private Business
HH	Households
CG-PA	Central Government and Public Authorities
PSE	Public Sector Enterprises

Table A-1. BALANCE SHEET FOR CENTRAL BANK OF EGYPT, FISCAL 1985

	Percentages of GDP
ASSETS	
R(CBE,F)	-3.8%
L(CBE,CG-PA)	45.4%
L(CBE,BC)	1.2%
L(CBE,IDB)	4.1%
FCL(CBE,CG-PA)	0.0%
FCL(CBE,BC)	0.1%
FCL(CBE,IDB)	0.2%
L(CBE,OT)	0.7%
LIABILITIES	
C(HH-PB,CBE)	23.8%
C(BC,CBE)	1.6%
D(BC,CBE)	11.9%
D(IDB,CBE)	0.3%
D(CG-PA,CBE)	4.1%
FCD(CG-PA,CBE)	2.1%
FCD(BC,CBE)	2.0%
FCD(IDB,CBE)	0.7%
NW(CBE)	1.0%
D(OT,CBE)	0.4%
VERTICAL CHECK	0.0%
TOTAL ASSETS	47.9%
TOTAL LIABILITIES	47.9%
ASSETS-LIABILITIES	0.0%

Table A-2. BALANCE SHEET FOR COMMERCIAL BANKS, FISCAL 1985

	Percentages of GDP
ASSETS	
R(BC,F)	5.7%
R(BC,C)	1.6%
R(BC,CBE)	12.0%
D(BC,CBE)	5.2%
L(BC,CG-PA)	15.4%
FCL(BC,CG-PA)	2.5%
L(BC,PSE)	11.8%
FCL(BC,PSE)	0.8%
L(BC,HH)	1.5%
FCL(BC,HH)	0.1%
L(BC,PB)	16.5%
FCL(BC,PB)	6.8%
L(BC,IDB)	2.7%
FCL(BC,IDB)	2.1%
L(BC,OT)	2.2%
LIABILITIES	
DD(HH,BC)	4.1%
FCDD(HH,BC)	1.6%
DD(PB,BC)	2.1%
FCDD(PB,BC)	1.9%
DD(IDB,BC)	0.1%
FCDD(IDB,BC)	0.6%
DD(OT,BC)	-1.5%
TD(HH,BC)	19.7%
FCTD(HH,BC)	9.3%
TD(PB,BC)	1.9%
FCTD(PB,BC)	11.2%
TD(IDB,BC)	0.1%
FCTD(IDB,BC)	1.6%
D(CG-PA,BC)	4.1%
FCD(CG-PA,BC)	5.1%
D(PSC,BC)	10.0%
FCD(PSC,BC)	2.6%
D(CBE,BC)	1.2%
FCD(CBE,BC)	0.4%
NW(BC)	8.5%
D(OT,BC)	2.2%
VERTICAL CHECK	
ASSETS	86.8%
LIABILITIES	86.8%
ASSETS-LIABILITIES	0.0%

Table A-3. BALANCE SHEET FOR THE NATIONAL INVESTMENT BANK, FISCAL 1985

	Percentages of GDP
ASSETS	
R(NIB,C)	0.9%
L(NIB,PSE)	3.3%
L(NIB,IDB)	10.7%
L(NIB,PSE)	33.4%
L(NIB,PA)	3.1%
L(IDB,PSE)	0.2%
L(NIB,OT)	0.2%
LIABILITIES	
L(PSE,NIB)	1.6%
L(CG,NIB)	0.8%
L(HH,NIB)	18.5%
L(PB,NIB)	18.5%
B(CG,NIB)	5.8%
L(CBE,NIB)	6.0%
L(OTH,NIB)	0.0%
NW(IDB)	0.5%
VERTICAL CHECK	
ASSETS	51.8%
LIABILITIES	51.8%
ASSETS-LIABILITIES	0.0%

Table A-4. BALANCE SHEET FOR OTHER FINANCIAL INSTITUTIONS, FISCAL 1985 (Other Banks, Including Development Banks)

	Percentages of GDP
ASSETS	
R(IDB,F)	2.4%
R(IDB,C)	1.0%
L(IDB,CG-PA)	3.3%
FCL(IDB,CG-PA)	0.1%
L(IDB,PSE)	0.3%
FCL(IDB,PSE)	0.4%
L(IDB,HH)	0.1%
FCL(IDB,HH)	0.1%
L(IDB,PB)	7.3%
FCL(IDB,PB)	5.0%
L(IDB,CBE)	0.3%
FCL(IDB,CBE)	2.8%
L(IDB,BC)	0.2%
FCL(IDB,CBE)	1.5%
L(IDB,OT)	3.4%
LIABILITIES	
DD(HH,IDB)	0.1%
FCDD(HH,IDB)	0.3%
DD(PB,IDB)	0.8%
FCDD(PB,IDB)	0.6%
TD(HH,IDB)	0.7%
FCTD(HH,IDB)	2.7%
TD(PB,IDB)	1.3%
FCTD(PB,IDB)	3.2%
D(CG-PA,IDB)	0.4%
FCD(CG-PA,IDB)	0.0%
D(PSC,IDB)	0.4%
FCD(PSC,IDB)	0.3%
D(CBE,IDB)	3.2%
FCD(CBE,IDB)	1.7%
D(BC,IDB)	3.2%
FCD(BC,IDB)	1.7%
NW(IDB)	2.6%
D(OT,IDB)	5.1%
VERTICAL CHECK	
ASSETS	28.3%
LIABILITIES	28.3%
ASSETS-LIABILITIES	0.0%

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